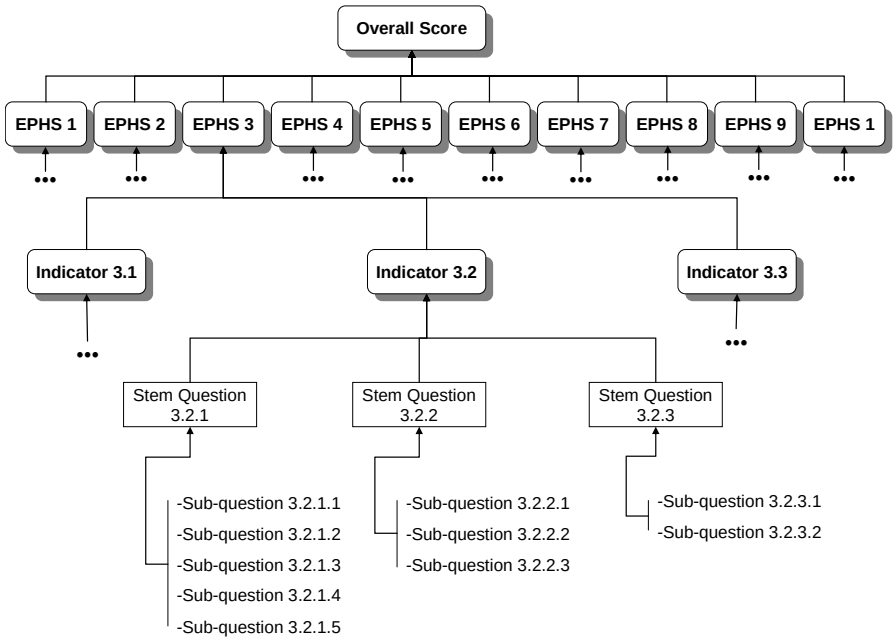
NATIONAL PUBLIC HEALTH PERFORMANCE STANDARDS PROGRAM

SCORING METHODOLOGY FOR REVISED ASSESSMENT INSTRUMENTS

The Ten Essential Public Health Services (EPHS) serve as the underlying framework for the performance assessment instruments. Each Essential Service is divided into several indicators, which represent major components of performance for each service. Each indicator has an associated model standard that describes aspects of optimal performance, along with a series of assessment questions that serve as measures of performance. These questions begin with a stem (or first-tier) question, followed by a series of sub-questions (Figure 1).

Figure 1: Scoring Logic and Hierarchy for the Assessment Instruments



Each question and sub-question use a five-point, Likert-type response option that indicates the extent to which the activity is performed by the public health system. A numeric value is assigned to each response option as follows:

Response Option	Response Value
No activity	0.00
Minimal activity	0.25
Moderate activity	0.50
Significant activity	0.75
Optimal activity	1.00

The scoring methodology for the assessment instrument establishes a weight for each question, and then multiplies the weight by the response value to obtain a weighted value for each question. These weighted values are combined to construct performance scores for each indicator and each

Essential Service, along with an overall performance score. This process is implemented through the four steps described below.

Step 1: Construct Question Scores

The first step in the scoring process is to construct a score for each grouping of questions, defined as the stem question and all its associated sub-questions. Most stem questions have between 2 and 5 associated sub-questions, but some have no sub-questions and others have more than 5 sub-questions. Each grouping of questions is given a weight of 1 point. Half of this point is assigned to the stem question, creating a weight of 0.5 for each stem question. The remaining half-point is distributed equally among all the sub-questions associated with the stem question. The weight assigned to each sub-question is therefore determined by the number of associated sub-questions. For example, if five sub-questions are associated with the stem question, then each sub-question receives a weight of 0.1. If a stem question has no sub-questions, the stem question is given the full weight of 1 point.

For each stem question, a weighted value is calculated by multiplying the weight times the response value for that question. Similarly, the weighted value for each sub-question is calculated by multiplying the weight times the response value for each sub-question. A ***question score*** is then constructed for each grouping of questions by adding together the weighted value for the stem question and the weighted values for each associated sub-question. The result is a weighted average of the stem question and sub-question responses. The resulting number is multiplied by 100 so that it can be interpreted as a percentage of the maximum possible score. Table 1 provides an example of this process for the question grouping associated with indicator 1.1.

Table 1: Example Methodology for Computing Question Score

Question	Response	Response Value	x	Weight	=	Weighted Value
Q1.1.1 (stem)	Moderate	0.50		0.500		0.25
Q1.1.1.1	Minimal	0.25		0.125		0.03125
Q1.1.1.2	Significant	0.75		0.125		0.09375
Q1.1.1.3	Significant	0.50		0.125		0.09375
Q1.1.1.4	Moderate	0.50		0.125		0.0625
Sum the weighted values						0.53125
Multiply by 100 to obtain question score						53.1%

Step 2: Construct Indicator Scores

As a second step in the scoring process, question scores are aggregated into a score for each indicator. Each indicator has between two and five associated question scores, based on the number of stem questions contained within the indicator. The ***indicator score*** is computed as a simple average of the associated question scores (*QScores*), as in the following example for Indicator 1.1:

$$\text{Indicator Score 1.1} = \frac{\left(QScore_{1.1.1} + QScore_{1.1.2} + QScore_{1.1.3}\right)}{3}$$

Step 3: Construct Essential Public Health Service Scores

A score for each Essential Public Health Service is computed by aggregating the associated indicator scores. Each Essential Service has between two and four associated indicator scores. The ***Essential Service score*** is computed as a simple average of the associated indicator scores (*IScores*), as in the following example:

$$\text{Essential Service Score 1} = \frac{\left(IScore_{1.1} + IScore_{1.2} + IScore_{1.3}\right)}{3}$$

Step 4: Construct Overall Performance Score

Finally, an ***overall performance score*** is computed as a simple average of the 10 Essential Service scores (*SScores*) as follows:

$$\text{Overall Score} = \frac{\sum_{i=1}^{10} SScore_i}{10}$$

The appendix provides a full example of the scoring method for Essential Service 1.

Appendix I - Special Cases for Scoring

Local Public Health Governance Assessment Instrument and State Public Health System Assessment Instrument

None

Local Public Health System Assessment Instrument

5.1.3 Does a BOH or other governing entity conduct oversight for the local health department?
5.1.3.1 Has this local BOH or other governing entity completed the NPHPSP?
5.1.4.1 Have state partners completed the NPHPSP with input from the local level?
5.3.1.8.1 Is the community health improvement plan linked to a state health improvement plan?

These questions are not used in the final score, since the existence (or lack of existence) of a board of health or other governing entity should not reflect negatively on the public health system. Additionally, the LPHS should not be penalized if the governing entity or the state partners have not completed other NPHPSP assessment, or if a state health improvement plan does not exist.

Scoring Solution: Scoring is implemented as follows:

1) A score of Zero has been assigned to this question and it has been excluded from the averaging and analysis process.

2) This question is excluded from the analysis and scoring (averaging) at the indicator and EPHS levels.

Appendix: Example Score Calculations for Essential Service #1

Question	Weight	Response	Response Value	Weighted Value	Question Score	Indicator Score	Service Score
1.1.1	0.5000	Minimal	0.25	0.1250	28.13%	15.36%	42.62%
1.1.1.1	0.1250	No	0.00	0.0000			
1.1.1.2	0.1250	Significant	0.75	0.0938			
1.1.1.3	0.1250	Minimal	0.25	0.0313			
1.1.1.4	0.1250	Minimal	0.25	0.0313			
1.1.2	0.5000	No	0.00	0.0000	9.62%		
1.1.2.1	0.0385	No	0.00	0.0000			
1.1.2.2	0.0385	No	0.00	0.0000			
1.1.2.3	0.0385	Moderate	0.50	0.0192			
1.1.2.4	0.0385	Moderate	0.50	0.0192			
1.1.2.5	0.0385	Moderate	0.50	0.0192			
1.1.2.6	0.0385	No	0.00	0.0000			
1.1.2.7	0.0385	No	0.00	0.0000			
1.1.2.8	0.0385	Significant	0.75	0.0288			
1.1.2.9	0.0385	No	0.00	0.0000			
1.1.2.10	0.0385	No	0.00	0.0000			
1.1.2.11	0.0385	No	0.00	0.0000			
1.1.2.12	0.0385	Minimal	0.25	0.0096			
1.1.2.13	0.0385	No	0.00	0.0000			
1.1.3	0.5000	No	0.00	0.0000	8.33%		
1.1.3.1	0.1667	No	0.00	0.0000			
1.1.3.2	0.1667	Moderate	0.50	0.0833			
1.1.3.3	0.1667	No	0.00	0.0000			
1.2.1	0.5000	Significant	0.75	0.3750	62.50%	37.50%	
1.2.1.1	0.5000	Moderate	0.50	0.2500			
1.2.2	0.5000	No	0.00	0.0000	25.00%		
1.2.2.1	0.5000	Moderate	0.50	0.2500			
1.2.3	1.0000	Minimal	0.25	0.2500	25.00%		
1.3.1	0.5000	Moderate	0.50	0.2500	75.00%	75.00%	
1.3.1.1	0.2500	Optimal	1.00	0.2500			
1.3.1.2	0.2500	Optimal	1.00	0.2500			
1.3.2	1.0000	Significant	0.75	0.7500	75.00%		